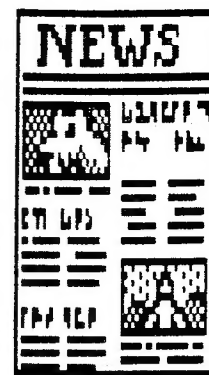
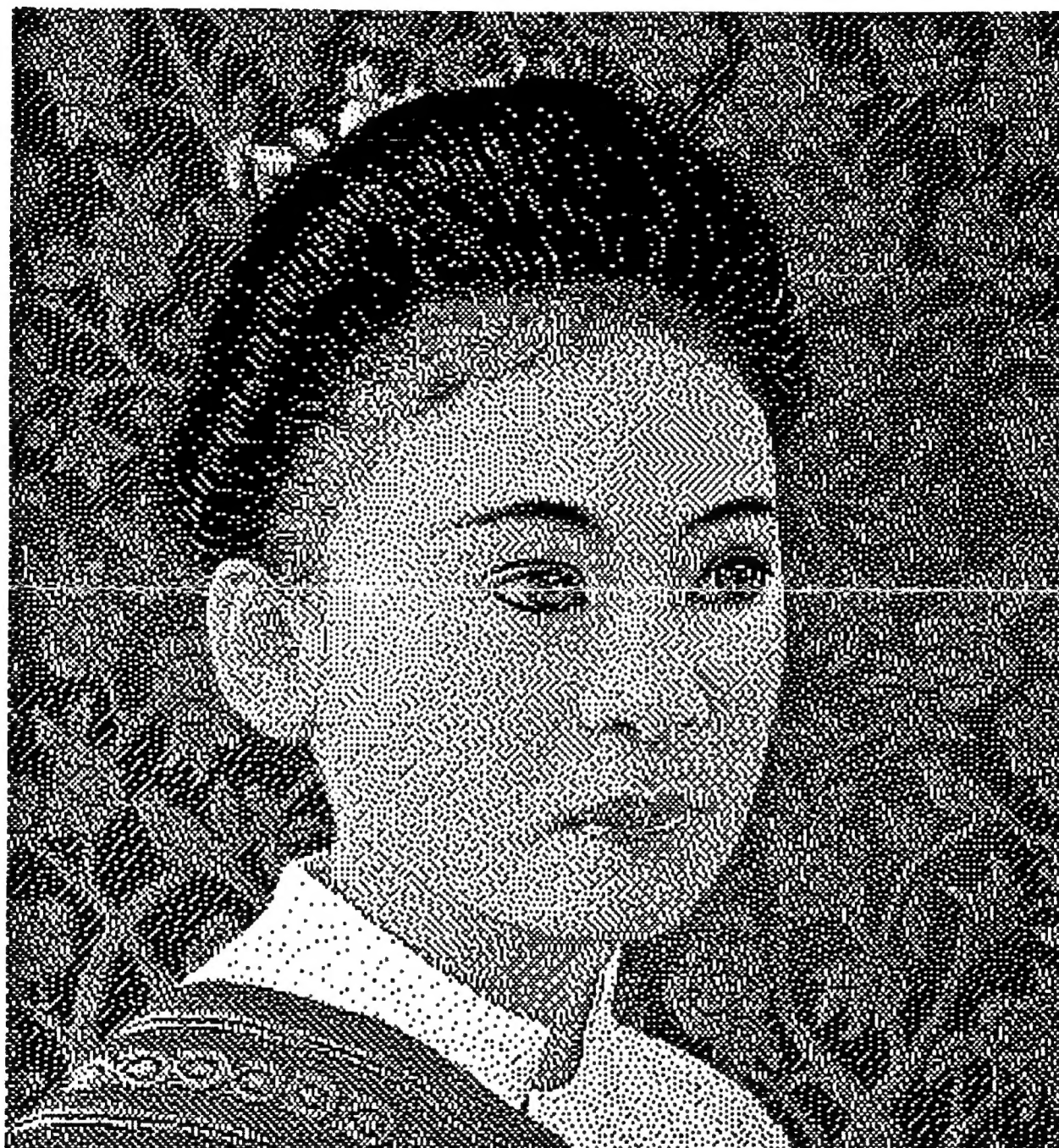


SINC-LINK



FINAL ISSUE



"THAT'S ALL FOR NOW.."

TORONTO TIMEX-SINCLAIR USERS CLUB

Editorial

Well, this is it. The last issue of Sinc-Link. Kind of sad.

After more than twelve years in publication we've run out of articles and steam.

It's nobody's fault. There just isn't enough interest to sustain either the newsletter or the club. The club executive is worn out and we don't have anyone else to hand our responsibilities over to.

The newsletter might have continued if there had been sufficient response from the out-of-town members in terms of articles, but none came in. Hugh was entertaining thoughts of continuing in a QL-only mode, but running a club and a newsletter is more than a one-man job and no one else offered to help.

For those of you readers with outstanding subscriptions, if you haven't already received a pro-rated refund, then you will soon.

To all of our members and supporters over the years, a hearty thank you. To the club executive, for years of dedication, **WELL DONE!**

That's all for now ...

Jeff Taylor

p.s. The cover and this editorial were produced on a TS-2068 using Print Factory and Mscript and printed on a HP Deskjet 500 inkjet printer complete with an FX-80 emulator cartridge. Anything is possible with a Timex-Sinclair computer. J.T.

Article Contributions

Send in your articles by tape
or disk and your inputs to:-

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Z80 - The Spectrum Emulator for MSDOS
by George Chambers

In the Sept/Oct 93 issue of Sinc-Link we published a review of the Z80 Emulator for MSDOS machines. The review was originally published in the Long Island S/T Users Group n/l, LISTing''. The author was John Pazmino. I had a copy of the shareware disk, and when I tried it in my 486 machine I was impressed with its performance. I sent off the money and received a registered copy. Let me tell you a little about that aspect.

I originally sent off an International Postal Money Order for \$15US. That was a mistake. The Postal Money Order bit, that is. Within ten days of my mailing the money order, I received my registered copy. But along with the disk, B.G. Services aka Brian Gaff, returned the money order. He told me that the banks there would only give him 2.70 UK Pounds, that is to say, about US \$5. Brian suggested that I send UK Pounds cash. Which I did, forthwith.

Now, of course it was my fault. I should have, at the least, made the money order out in UK Pounds. But note this. They did send the disk in trust, and did it extremely fast. Ten days. That's faster than I can get anything from the USA.

Now to the Emulator itself. Well, John Pazmino has described it pretty well in his article so I won't duplicate what he said. I'll simply relate my experiences with it to date.

I made up an interface cable so that I could load Spectrum/2068 tapes into the 486. This was pretty straight forward. One of the files on the disk contains a schematic. The interface requires 5 resistors and two capacitors. Two resistors were in European values, which interpret to a .047 mfd and .68 mfd mylar capaci-tors. The cord requires a connector to plug into the 15-pin printer port on the 486, and two male connectors to plug into the tape recorder. They suggest that the components could be housed within the 15-pin connector shell. I was not sure that I could cope with that small an area so I put the components into a small plastic box. It worked well.

There is a tape test mode in the program; a sliding bar on the computer screen that shows the signal level coming from the tape player. You adjust the tape player and a variable resistor in the interface until the signal onscreen is the proper level. I was able to load programs from tape quite routinely.

The simplest way to save programs is to capture the whole memory, saving it under whatever the program name is. The file is comp-ressed during the save, so that while the memory capture may be, say 45K, the compressed file will range anywhere from maybe 15K upwards.

One of the first things I did was to save some Spectrum games from tape. Very routine. One 3 1/2 disk held 41 game programs!

I then moved a number of programs over. Tasword, Pro/File, Timachine, Masterfile; and some of my own programs as well. I saved and loaded Tasword and Pro/File files via disks, and was able to print to the large printer.

I had to modify the Tasword program code in a couple of locations, since my copy had been adapted for the 2068, and a couple of CALLS were incorrect. Also I had to insert a CLEAR(RAMTOP) instruction. With the Spectrum one has to be concerned with the Stack. I changed the Larken disk calls, to ones for the Micro-Drives. And also I needed to open a new printer port, with an OPEN #3,'t'' instruction.

I have found that the PRO/FILE program needs some further modification. So far I have been able to print out the membership list, but the program fails when I try to make changes to the database. I have not searched for the problem yet.

Interestingly, I found the Spectrum version of Timachine worked very well. I recompiled one of my old compiled programs to test it out, and found it worked perfectly.

The documentation on the disk produces a document of about 50 pages. It is comprehensive, though like the Larken system documentation, it is rather terse. Takes a lot of studying to comprehend everything that is being said. Though I have the Micro-Drive LOAD/SAVE processes pretty well sorted out, a complete understanding of the disk (pseudo-tape) process still eludes me. I'm working on it!

There are some minor irritations. This is in connection with certain keys. The keyboard conventions vary from country to country. This shows up particularly in the punctuation characters in the top row of keys. The Emulator places the () characters on keys 8 and 9, instead of the US/Canada convention of keys 9 and 0. And the and * need watching. But these are rather trifling matters.

Can I recommend the Emulator? Most assuredly. It is a fine implementation. Ask me for a copy of the shareware. Best you state your wanted disk format. Or better still, send away for your registered copy to:

B.G. Services, 64 Roebuck Road, Chessington, Surrey KT9 1JX England. Send 15 pounds UK, or \$15 US.

There is some incentive to getting a registered copy. The share-ware copy does not contain the software needed for tape loading, nor does it provide for adjusting the Emulator speed on the faster MSDOS machines.

I'd be interested in hearing from any one else who makes use of the Emulator. Do drop me a line.

REVIEW OF Chris Boutal's GENEALOGIST 3

Page 1

by Hugh Howie

In a group of people gathered around the glowing embers of a fire of a winter evening, the talk can touch on many things, and invariably someone will say something which prompts another to say "I remember---" and the talk will often turn to reminiscences of a family member, relation, or acquaintance, who did this, that or something else, then the tales start to flow as to who what where and when. And that is where a programme such as GENEALOGIST 3 comes into its own.

This is a programme by Chris Boutal of the United Kingdom. Great Britain. England, Scotland, Ireland, Wales, call it what you wish. The lands of history and legend. The lands of brave Knights and Fair Damsels. The lands from where so many of us in Canada and the USA came. The land which so many still call "HOME" But do we really know where we came from?

We all know some of our ancestors, but can we put it together in some order and sequence, with the correct dates and times and facts? Who married who, and who begat who?

GENEALOGIST 3 is the programme to do this for you. All you have to do is provide the data and enter it, and the programme takes over and does all the work for you.

Enter names and dates and relationships, and before you realise what has happened you will be able to see a "Tree" grow from almost nothing.

The system is very comprehensive. All your family records, Births, Deaths, Marriages, Burials are stored, and can be displayed on screen, or sent to the printer in many different formats to suit your specific requirements.

GENEALOGIST 3 will keep track of census returns and certificates, and any other detail you have in mind. It has very complete search and indexing facilities.

You want to know your ancestors? your pedigree? Who are the heads of various family groups? Who you are? Where you

came from? No, it will not tell you where you are going, that's for you to solve. But I can vouch for this, it will make you want to KNOW the past! You will spend so much time in research into your family background, you will leave a lot of things unattended.

From the various Family Groups which you assemble as you enter data, a tree can be generated, and displayed on screen or paper for your perusal and reference. You can make amendments to the tree as you look at it, they can be made here or in the Family Group format. The Tree can be sent to the printer and this will give you a wonderful display of all the Ministers and Rogues and Vagabonds and Highwaymen, who are part of your heritage.

GENEALOGIST 3 is for the Pointer Environment, but can also be operated very efficiently from the keyboard if you don't have a mouse. Selection of facility can be made by using the arrow keys, or by letter selection from the menus, or mouse. Very versatile.

I have had Genealogist version 1 and version 2. When Version 3 came along I debated whether I needed it, and after a lot of poking around in the recessed area of the wallet - I came up with a few moths and the necessary moolah to purchase version 3, and I have not regretted it for one instant.

It would appear that when so much keyboard work is required, that the constant work of moving a hand from mouse to keyboard and back again, would be rather tiresome, but this I have found not to be the case. When you are entering data, you will find that the arrow keys are fine and dandy for moving around. But when you start to RESEARCH the data, looking for cross-references etc., does that mouse ever scoot around the screen! Definitely - the mouse is a great advantage - but don't forget, if you have no mouse the programme still provides all the facilities required, and at a goodly speed also.

REVIEW OF Chris Boutal's GENEALOGIST 3

Page 2

by Hugh Howie

Speed, now that is something else to be discussed. The full programme requires at least 512 Kb memory, so that lets out Microdrive and bare bones QL. With Trump Card, you have the extra speed, and also the extra memory required. With the Gold Card which is what I use, I find that the programme is fast enough for me. With the Super Gold Card? I am afraid you might burn up the screen with the extra speed the Super is reputed to have.

But then again, we have an author who thinks of those with less than the epitome of QL's. We have an author who thinks of the person who only has the basic 128k machine (are there any left?) There must be a few somewhere as Chris has provided a Budget version of GENEALOGIST for those people. And this Budget version is on MDV or Disk! You want - you got!

Now say you have been working on an Archive based family, and having problems transferring it to this new system, then for a modest fee (very modest) Chris will convert that to GENEALOGIST for you.

For those who have been using one of the earlier versions of GENEALOGIST, the data made with those versions will not work with Version 3, but once again, all is provided for, there is a conversion programme provided. And it really does work, as I used it myself.

In the manual there is a tutorial family for you to type in, and after following the tutorial, you will have no problem in getting down to your own task. The manual is very well written indeed, with easy and clear instructions as to what to do, and when. There is an excellent "Command Reference" Section, where you can see what each command does, and where it is called from. Printed on pink paper in nice clear distinct black type, it may be thought that the pink paper could be a bit hard to read, but this is not the case, the manual is easy to read, easy to follow, and of great precision.

The programme will take all the data you like to enter, from the heads of

families, which is all that is really required, but also all your brothers and sisters and aunts and cousins. Just about anything you want to put in.

If you want a screen or paper copy of a family tree from the start, or from a midway point, to a midway point - that is what is available.

Let me say here and now, when I say you can have a copy, I mean that you can have a copy ON SCREEN or on PRINTER, so those terms are synonymous. When using the printer the option of Normal or Condensed type is available.

GENEALOGIST 3 will provide a geographical map of occurrences. This is based on the grid system in use in British road maps, and when I suggested to Chris that the programme was reaching the far corners of the earth where that grid system might not be in use, and that a Latitude & Longitude option be made available, Chris agreed and said that he would look into this, and perhaps introduce it at a later date. But don't let this stop you from acquiring the programme. This is an enhancement that I do not require, and I wonder how many really do. I only introduce those comments to show how Chris has tried to provide everyone with what anyone would like. This "map" facility, will even tell you the distance between two points when using the grid system.

I almost forgot to tell you that it will even provide pictures to go with a family group. Say you have a picture of your old Uncle Ned and Aunt Sarah at Xmas, you do have that picture? Then by use of a Video camera and a digitiser, you can save that picture on disk, and later project that picture on screen. There are even a couple pictures provided as an example. I can see this programme taking the place of slide shows. Do you remember them?

For those interested in Kings and Queens of Britain, a Royal Tree is provided, just so you see what a tree looks like.

REVIEW OF Chris Boutal's GENEALOGIST 3

Page 3

by Hugh Howie

Do you want to know who is related to whom, and what that relationship is? You got it! D'ya really need to know that "Jo Blo is the second cousin twice removed from Jenny Jewell"? Or that "Dan is the great-great-great-grandfather of Dave? The cross-reference is there.

For those occasions when the spelling of a surname has been changed over the years, that also has been taken care of, as multiple spellings are recognised.

The user is even allowed to make up a customised Research Report to suit ones own requirements, as before making the report, you are allowed to select the details (from a list of thirteen) you wish to appear in the report, but not only that, you are permitted to select whether the report should appear in row or column format.

There is even a "Verify" mode provided. Say you enter the birth of a parent as 1900 and the son as being born in 1905, this "verify" will tell you "40 and 35 have an unlikely generation gap". Plus many other things. (The programme gives each family member its own unique number)

Much of the data is available for export to the Psion suite of programmes. This is to enable you to do further processing that GENEALOGIST can't do. For example the Family Network and Research reports can be exported to Archive. Tree data can go to Abacus. Place/Time data can be exported to Easel. Those same files can be imported back into Genealogist from Psion.

The programme comes set up for a red screen with white lettering, but if you don't like that you are provided with a facility to change that to white on black or almost any other combination you can think of. You make your own colour combination choice for any window.

As I am also writing a lot stuff dealing with such things as movements, occupations, anecdotes, family histories and a whole lot of interesting, and some not so interesting facts, that kind of

stuff, I have GENEALOGIST and text⁸⁷plus⁴ running together, this way I can quickly switch from one to the other as I progress. In fact it is possible to have two TREES going at the same time - but watch your memory!

Now to a neat little thing. As the programme starts, there is a little square clock that comes onto the middle of the screen, with real hands! and it keeps popping up as you change from one facility to another - just to remind you of the passage of time! Neat neat neat.

You don't want to keep a record of your family? Then use this programme to keep track of those cats and dogs and horses you breed, it can be used for just about any record of ancestry or breeding you wish.

Now where is this programme available? Why, from my old friend:-

DILWYN JONES COMPUTING
41 BRO EMRYS, TAL-Y-BONT, BANGOR
GYNEDD, UNITED KINGDOM, LL57 3YT

The last price I have is from the December 1993 Price List but I would advise you to check first, I don't think the price has gone up in that time, but then the time between writing and publication is not always predictable.

Genealogist 3 (Pointer)	£60.00	Disk only
Genealogist 2	£30.00	Disk only
Genealogist 1	£19.50	Disk only
Genealogist Budget	£12.00	MDV/Disk

But if you really are serious about this, I would recommend the version 3 (Pointer)

One final thing which I consider to be very important, what happens when you have a problem? Why you write to Chris Boutal and the answer is on your desk before you know it. Service is terrific. But then if you have a programme as terrific as this, then you would also expect the service to be terrific - and it is.

940910

XTender - A ZX81 Emulator For The PC

Rene Bruneau

Aug/Sept 1994

The Old Days

I bought my first TS1000 in the winter of 1984 for \$39.95. A couple of months later, I picked up a Gladstone 64k rampack for about the same price. At the time, I wanted to learn more about computers and programming, but couldn't justify spending a bundle on an Apple clone. The IBM PC was available, but at a much higher cost. (Apple at this time was well established in the home market, while IBM targeted their machines for the business office). After a couple of weeks of writing and saving small programs on the TS1000, I ambitiously typed in a big program. After some 4 hours of typing, I reached over to press the save key on the tapedeck, bumped the computer, and after another 4 hours of typing I had saved my first big program.

Today and Tomorrow

The rest as they say is history. I currently own about 7 working TS1000s and some 10 others that don't work or are missing the ULA. I have the Larken disk operating system, the JLO video upgrade, designed and built serial, parallel, keyboard, and video interfaces, and collected various programmers, sound boards and other peripherals that were available for the TS1000. I also have a 2068 with the Larkin DOS, and built the JLO SAFE system with the thought of converting it to run on a TS1000. At one time I had a QL, but let it go when I realized that it wasn't cost effective to expand it (at the time I was also buying a PC for work related activities). Am I going to give my Timex-Sinclair stuff away? Not yet. I am still having too much fun playing with them!

XTender

Having said that, one of the programs that I have purchased for the PC is a ZX81 emulator program called XTender, written by Carlo Delhez of Holland. This emulator turns the PC into a Super ZX81. When you run the program, what you see on the screen looks like a ZX81, the keys you press react like a ZX81. However, in writing the emulator, Mr Delhez has been able to add additional functions and features.

Keyboard

Most of the keys on the PC keyboard are mapped onto the ZX81, including the cursor and numeric pad. The Esc key is Shift-1 (Edit), the Backspace key is Shift-0 (Delete), the 'Cursor Left' key is Shift-5, Alt-4 is \$, etc. In addition, the keys are auto repeat. No more hammering the keyboard to generate that long string of characters!

DOS

In the emulator, the ZX81 now has a Disk Operating System. In addition to the normal program LOAD and SAVE operations which create '.P' files, Basic, Code, Lines, Screen, and Variables files are also supported. The ZX81 DOS also emulates all of the MS-DOS features to allow you to create and remove directories, change to different directories or drives and save or delete files from the hard drive or disk drives. The Basic 'B' and Variables 'V' filetypes are compatible with ZYTERMS0 (Fred Nachbaur's HiRez Modem program) Program and

Variables Upload and Download routines.

The copy of XTender that I have (Ver 1.10) didn't have a tape loading routine to transfer files from a ZX81 to the PC or a print driver routine but that may have changed since I received my registered copy. With registration, however, I did receive 2 additional disks containing a total of 160 programs for the ZX81 and a third disk of 80 programs is now available.

Compatibility of the emulator is almost 100%. A few programs that use the ear/mic lines or the ZX81 external bus (eprom programmers, sound generators, etc) not available on the PC won't work for obvious reasons.

Coral Basic Interpreter

A bonus feature of XTender is the inclusion of a program called the ZX81 Coral Basic Interpreter (CBI) written by Mr Delhez. This program provides you with a full screen editor and 43 new commands that provide features like automatic line numbering, block delete, conditional loop structures (DO, LOOP, EXIT, WHILE, UNTIL, IF and ELSE) that allow you to do structured programming, DATA, READ, and RESTORE for data manipulation, and machine code applications like DPOKE (double poke), DPEEK (double peek), USER and CALL. The program also provides enhancements to some of the old commands like LIST, CLS, SCROLL, PLOT and INPUT. An added feature is the program's ability to print descriptive error messages.

If you have a PC or are looking to move to that platform, XTender is an excellent program to have.

ORDERING

To order the program, send a money order or bank draft worth NLG 60 (Dutch Guilders - about \$45 Canadian) to:

Carlo Delhez,
Emmastraat 3,
4651 BV Steenberghe,
Netherlands

A shareware disk is available at a nominal cost if you want to evaluate the program.

To Print or Not to Print

In the last newsletter, Mr Juergen made a comparison between QL and IBM PC screen dumps. In the letter he indicated that the IBM screen dump will sometime print garbage instead of what is shown on the screen. Quite true, but to understand what is going on, you have to know that the IBM is capable of handling the display file in two modes, Text and Graphics, and it is the printer, not the computer, that is at fault for printing the garbage. Lines drawn in a text screen are displayed using what is called the IBM Extended Graphics Set. Most printers these days will support the IBM graphic characters, however, factory settings for the printer usually default to a standard setting that provides ASCII, Italic, and International characters sets, hence the garbage that prints out if you do a screen print on an IBM PC. To get a 'true' text dump, you have to set the dip switches on the printer to print the IBM graphics set. Of course, if you have one of the older printers like the Smith Corona Fastext 80 or the Radio Shack DMP105 you're stuck with the garbage.

```
ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
3          VSafe Warning Options                      3
3 ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDEDDDD? 3
3 3 3 Warning type                                3 ON 3 3
3 CDEDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDEEDDDD4 3
3 313 HD Low level format                        3 { 3 3
3 323 Resident                                  3   3 3
3 333 General write protect                       3    3 3
3 343 Check executable files                     3    3 3
3 353 Boot sector viruses                        3 { 3 3
3 363 Protect HD boot sector                    3 { 3 3
3 373 Protect FD boot sector                   3    3 3
3 383 Protect executable files                 3    3 3
3 @DADDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY 3
3 Press 1-8 toggle ON/OFF                          3
3 Press <ESC> to Exit                              3
3 Press ALT-U to unload from memory                3
@DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
```

VSafe Warning Options		
	Warning type	ON
1	HD Low level format	✓
2	Resident	
3	General write protect	
4	Check executable files	
5	Boot sector viruses	✓
6	Protect HD boot sector	✓
7	Protect FD boot sector	
8	Protect executable files	

Press 1-8 toggle ON/OFF
 Press <ESC> to Exit
 Press ALT-U to unload from memory

SOUND FOR THE ZX81

R. Bruneau

Sept 1994

This project is specifically for the ZX81/TS1000, giving it the same sound capabilities as the 2068 and a joystick port. The circuit is quite old, being published in various magazines in the 1985/1986 period. The biggest problem using the AY-3-8912 with a ZX81 is the lack of In and Out commands and the number of registers on the chip that have to be programmed to generate the desired sounds. Earlier this year, I began to experiment with Fred Nauchbaur's SHREB (Static ram High Resolution Extended Basic) to see if I could modify a program written for the Spectrum (Ref. 1) that would simplify the programming of the sound chip. The results are approximately 600 bytes of code that reside in a REM statement that provides three new commands accessed by the BASIC Command:

IF USR M[MUSIC] THEN LPRINT Command; Parameters
(previously defined: M[MUSIC]=16586)

1. P[LAY];d,e,n,t
where d = duration 0-65535
e = envelope 0-7 (fig 1)
n = noise channel 0-7
t = tone channel 0-7

PLAY enables the channels and defines the type of sound that MUSIC and SOUND will make. There are 3 noise and 3 tone channels and 8 envelope shapes. The channels are activated as follows:

0	000	no channels
1	001	Channel A
2	010	Channel B
3	011	Channels A & B
4	100	Channel C
5	101	Channel A & C
6	110	Channel B & C
7	111	Channel A, B & C

2. M[MUSIC];v,n,o,c
where v = volume 0-15
n = note 1-12 (fig 2)
o = octave 0-6
c = channel 1-3

MUSIC must be used with PLAY. Octave 0 starts 2 below middle C. If volume is set to zero, control of the output is passed to the envelope generator of PLAY.

3. S[OUND];v,p,c
where v = volume 0-15
p = pitch 0-65535
c = channel 1-6

SOUND simply blasts a tone of the specific pitch through the specified channel. FLAY is used to select the envelope shape and duration.

Commands can be chained together, separated by a semi-colon. Error checking is done when the program is run. Errors P, M, and S will indicate parameter errors in the respective PLAY, MUSIC and SOUND commands.

The AY-3-8912 also has one I/O port that can be accessed via register 14 and a machine code routine has been included at 17037 to use it. LET variable = USR 17037 will give the status of the I/O port.

As it stands, the machine code is NOT relocatable, but can be reassembled at any address required (for example, as an addition to SHREB). For those who have boards that use the AY-3-8910 or 8912, such as the ZON X-81, it is a simple matter of changing the port addresses. This board uses Port 215 (D7h) to set the register and Port 223 (DFh) to transfer the register data.

GETTING STARTED

Schematics, printed circuit board and placement drawings are shown on the following pages. To set up the software, start by typing in the following:

- 1 PRINT (80 zeros separated by plus signs)
2 REM

As a direct command type: POKE 16513,234
POKE 16509,0

Key in the Hex loader and machine code (Listing 1 & 2). When that is done, delete everything after Line 2 and enter the Demo program in Listing 3.

Any questions can be directed to

Rene Bruneau, 120 Salem Ave
Toronto, Ontario, Canada, M6H 3C3

Ref 1. The Sound of Music
John Ainslo
ZX COMPUTING Dec 1985/Jan 1986

AY-3-8912 PARTS LIST

CAPACITORS

C1	220p Ceramic
C2	100p Ceramic
C3,4,5	0.100u Polyester
C6	0.047u Polyester
C7,8	4.7uF/16v Electrolytic
C9	100uF/16v Electrolytic

RESISTORS

R1,2	470R
R3	10K
R4,5	1K
R6	10R
RV1	10K Trim Pot

SEMICONDUCTORS

IC1,2	74LS02	14 pin
IC3	74LS688	20 pin
IC4	AY-3-8912	28 pin
IC5	LM386	8 pin

MISCELLANEOUS

3.5mm Jack Socket, IDC 9-pin (male) socket, ZX81 Edge connector,
sockets for ICs (2-14 pin, 1-20 pin, 1-28 pin, 1-8 pin)

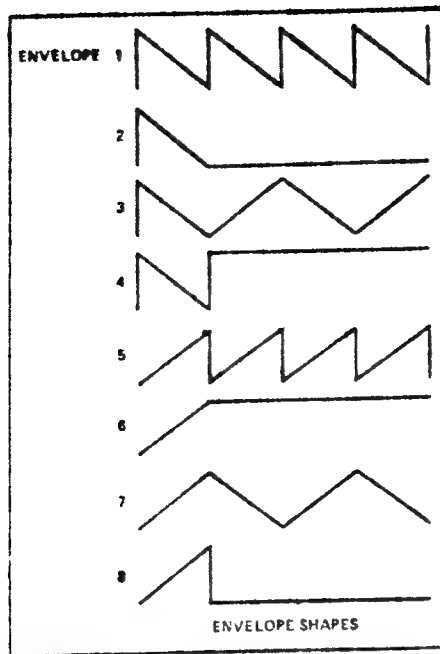


Figure 1. Envelope Shapes

NOTES	2 4			7 9 11			
	C# D#			F# G#		A#	
	C	D	E	F	G	A	B
NOTES	1	3	5	6	8	10	12
OCTAVE	0						

Figure 2. Musical Scale

REGISTER	FUNCTION	BIT							
		7	6	5	4	3	2	1	0
R0	Channel A - Tone Period	8 Bit Fine Tone A							
R1						4 Bit Course Tone A			
R2	Channel B - Tone Period	8 Bit Fine Tone B							
R3						4 Bit Course Tone B			
R4	Channel C - Tone Period	8 Bit Fine Tone C							
R5						4 Bit Course Tone C			
R6	Noise Period				5 Bit Control				
R7	Channel Enable		I/O	Noise			Tone		
				C	B	A	C	B	A
R8	Channel A - Amplitude				Env	4 Bit Control			
R9	Channel B - Amplitude				Env	4 Bit Control			
R10	Channel C - Amplitude				Env	4 Bit Control			
R11	Envelope Period	8 Bit Fine Control							
R12		8 Bit Course Control							
R13	Envelope Shape					4 Bit Control			
R14	I/O Port	8 Bit Parallel Port							
PSG REGISTERS									

Figure 3. AY-3-8912 Registers

Figure 6. Music Demo

```

30 REM MACHINE CODE SAVED IN
  LINE 1
3 REM LINE 1 CONTAINS 650
  BYTES
10 SAVE "MUSIC"
100 LET M=16386
110 IFUSR M THEN LPRINT P;0,0,
0,1
120 GOTO 1000
130 REM SOUND DEMO
  VOLUME 0-15
  PITCH 0-65335
  CHANNEL 1-3
205 IFUSR M THEN LPRINT P,0,0,
0,1
210 FOR P=1 TO 500 STEP 10
220 IFUSR M THEN LPRINT S;5,8*
P,1
230 PAUSE 10
240 IFUSR M THEN LPRINT S,5,4*
P,1
250 PAUSE 10
260 IFUSR M THEN LPRINT S;5,12
*P,1
270 PAUSE 10
280 NEXT P
290 IFUSR M THEN LPRINT P;0,0,
0,0
295 GOTO 1000
300 REM PLAY DEMO
  DURATION 0-32767
  ENVELOPE 0-7
  NOISE CHANNEL 0-7
  TONE CHANNEL 0-7
305 CLS
310 PRINT "INPUT ENVELOPE SHAPE"
320 INPUT E
325 IF E>8 THEN GOTO 1000
330 PRINT "INPUT DURATION"
340 INPUT D
350 IFUSR M THEN LPRINT S;0,15
0,1,P,0,0,0,1
360 PRINT AT 10,2;"PRESS ANY KE
/ TO RE-ENTER"
370 PAUSE 4E4

```

```

375 IFUSR M THEN LPRINT S;0,15
0,1,P,0,0,0,1
380 CLS
390 GOTO 300
400 REM MUSIC DEMO
  VOLUME 0-15
  NOTE 1-12
  OCTAVE 0-6
  CHANNEL 1-3
405 CLS
410 IFUSR M THEN LPRINT P,0,0,
0,1
420 FOR O=0 TO 6
425 PRINT O;" ";
430 FOR N=1 TO 12
435 PRINT N;" ";
440 IFUSR M THEN LPRINT M,3,N,
0,1
450 NEXT N
465 PRINT
470 NEXT O
480 IFUSR M THEN LPRINT P,0,0,
0,0
1000 CLS
1010 PRINT "AY-3-8912 SOUND DEMO"
1020 PRINT AT 6,5;"1. SOUND DEM
O"
1030 PRINT AT 8,5;"2. PLAY DEMO
"
1040 PRINT AT 10,5;"3. MUSIC DE
MO"
1050 PRINT AT 20,5;"PRESS 1,2, O
P 3"
1060 IF INKEY$="" THEN GOTO 1060
1070 IF INKEY$="1" THEN GOTO 200
1080 IF INKEY$="2" THEN GOTO 300
1090 IF INKEY$="3" THEN GOTO 400
2000 PRINT AT 20,5;"PRESS 1,2, O
P 3"
2010 GOTO 1050
8000 PRINT USR 17037
8001 PAUSE 10
8002 GOTO 8000

```


Figure 4. Hex Loader

```

1 PRINT 0+0+0+0+0+0+0+0+0+0+0
+0+0+0+0+0+0+0+0
2 REM ** ENTER 80 ZEROS WITH
  PLUS SIGNS BETWEEN
3 REM ** POKE 16513,234
4 REM ** RUN HEX LOADER
90 PRINT "READ OR WRITE (R/W)"
95 INPUT M$
100 CLS
110 PRINT "START ADDRESS"
120 INPUT S
130 PRINT "FINISH ADDRESS"
140 INPUT F
145 IF M$="R" THEN GOTO 400
150 FOR N=S TO F STEP 8
160 LET T=0
170 SCROLL
180 PRINT N;" - ";
190 INPUT A$
200 PRINT A$;" = ";
210 INPUT TOT
220 PRINT TOT
230 LET Z=0
240 FOR K=1 TO LEN A$ STEP 2
250 LET C=(CODE A$(K)-28)*16+CODE
  A$(K+1)-28
270 LET T=T+C
280 POKE N+Z,C
290 LET Z=Z+1
300 NEXT K
310 IF TOT=T THEN GOTO 340
320 SCROLL
330 PRINT "ERROR - PLEASE INPUT
  AGAIN"
340 GOTO 190
350 NEXT N
360 STOP
400 FOR N=S TO F STEP 8
405 LET T=0
410 SCROLL
420 PRINT N;" - ";
430 FOR B=0 TO 7
440 LET C=PEEK (N+B)
445 LET T=T+C
450 LET F$=CHR$ (INT (C/16+28))
460 LET S$=CHR$ ((C-((CODE F$-2
  8)*16))+28)
465 PRINT F$;S$;
470 NEXT B
480 PRINT " = ";T
490 NEXT N
495 STOP

```

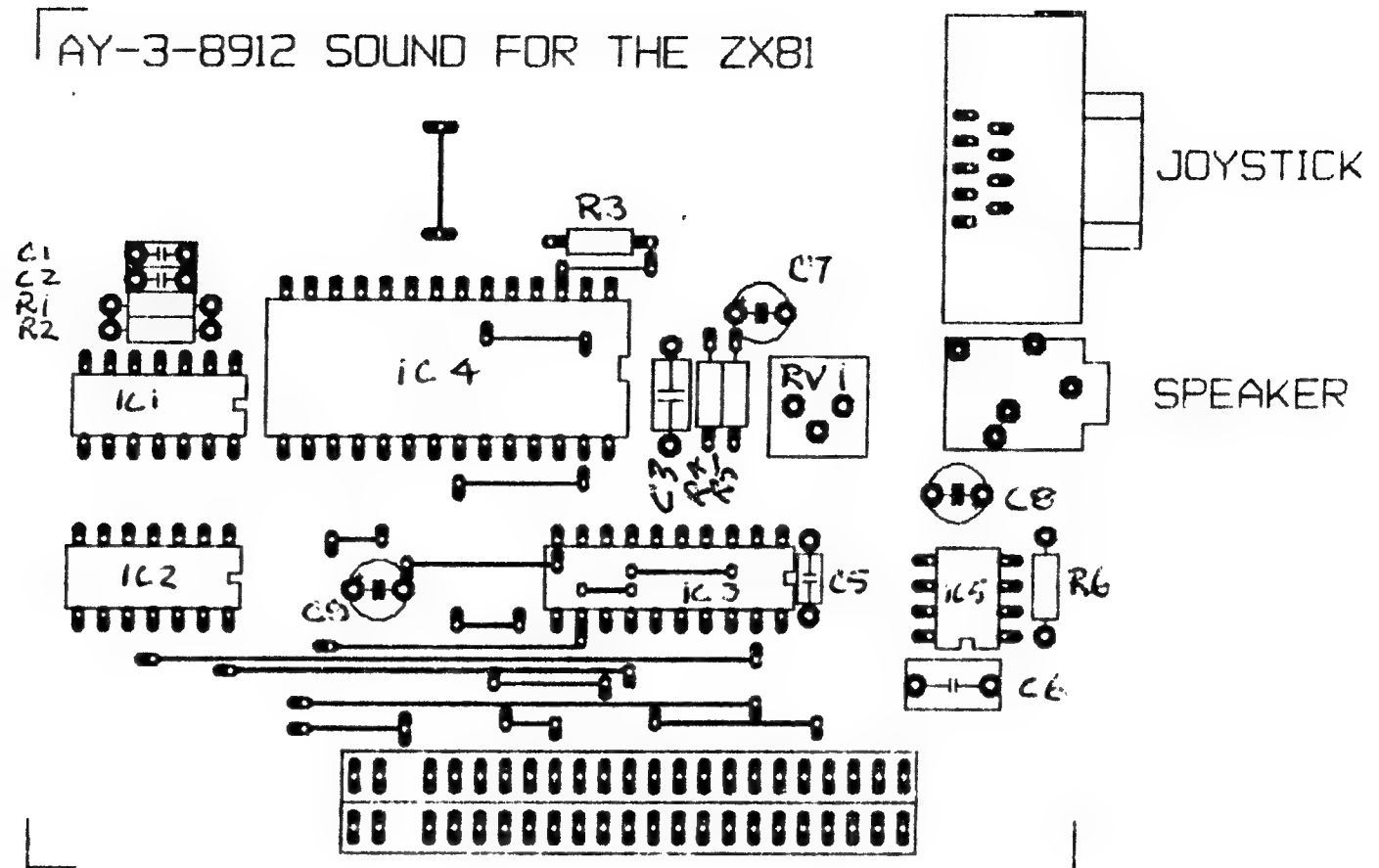
Figure 5. Machine Code Data

```

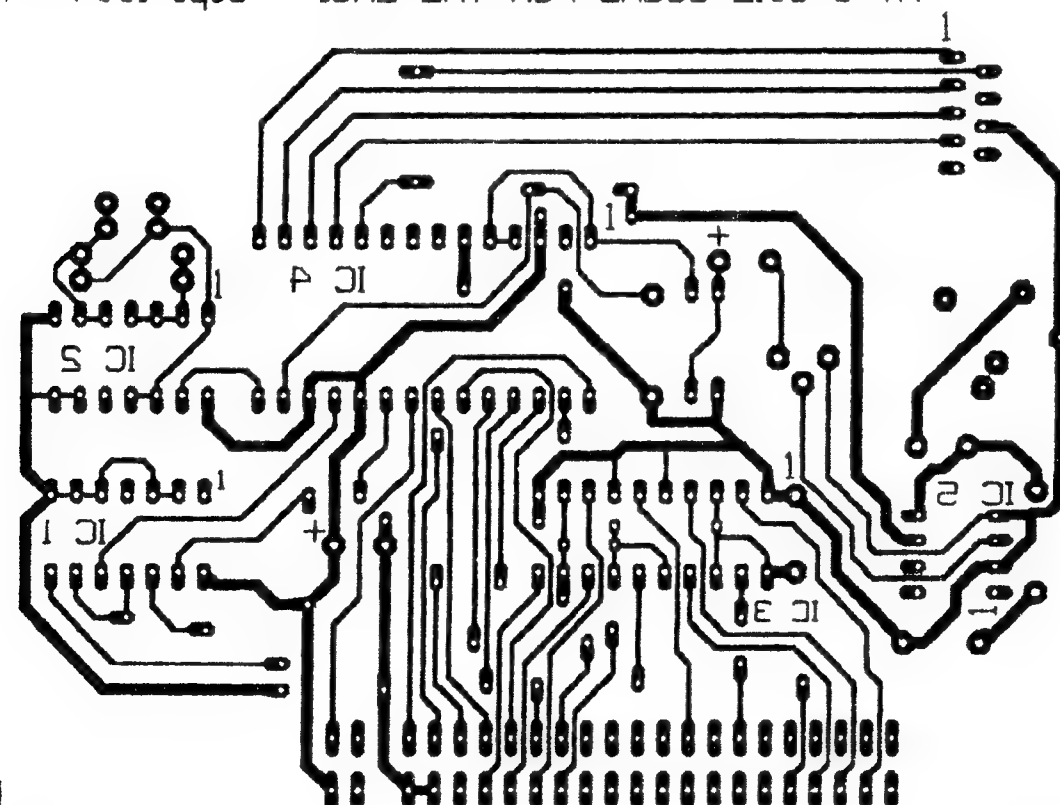
16514 - 7676F57EFE1A2802 = 920
16522 - CF18F1C9221640CD = 998
16530 - 550FE5C0CD15E1C9 = 1186
16538 - 221640CD550FE5CD = 850
16546 - A70EE1C9CD8E40CD = 1223
16554 - 8440C9CD9A40CD84 = 1157
16562 - 40C92A16407EFE19 = 798
16570 - 2624FE762802CF0D = 710
16578 - E1221640010000C9 = 547
16586 - 2A16407EFEDE2602 = 772
16594 - CF11E5237E11C240 = 869
16602 - D5FEE120F3D111B4 = 1373
16610 - 40D5237E47237EFE = 924
16618 - 7628E5FE1920F676 = 1064
16626 - FE32CA0641FE36CA = 1089
16634 - 8241FE35CAE741C3 = 1195
16642 - D240CF0A23CDA640 = 881
16650 - FE162872A72002C6 = 820
16658 - 16323D4023CDA640 = 887
16666 - FE0D3062A7285FD6 = 929
16674 - 0187E52175420600 = 587
16682 - 4F097E23464FED43 = 702
16690 - 3F40E123CDA640FE = 1076
16698 - 0730433CED4B4040 = 822
16706 - 473A3F401607CB19 = 515
16714 - CBB9C61FA710F732 = 1102
16722 - 3F407932414023CD = 867
16730 - 8E40FE043020A728 = 751
16738 - 1DF5C607323C40F1 = 894
16746 - D60187323E403C32 = 836
16754 - 4040E50603213C40 = 520
16762 - CD6A42C3B440CF15 = 1044
16770 - 23CDA640FE103036 = 842
16778 - A72002C610323D40 = 590
16786 - 23CDA0D4079323F40 = 775
16794 - 7632414023CD8E40 = 745
16802 - FE07301AA72617F5 = 810
16810 - FE043014C607323C = 841
16818 - 40F1D60187323E40 = 831
16826 - 3C324040161BCF1B = 523
16834 - C604323C40F13E06 = 885
16842 - 323E403240403A3F = 475
16850 - 40324140FE20D2C0 = 931
16858 - 41E50603213C40CD = 665
16866 - 6A42C3B44023CDA0 = 1024
16874 - 4079323D4076323F = 593
16882 - 403E0B323C403C32 = 421
16890 - 3E4023CDA640FE09 = 859
16898 - 3043A72802C60732 = 579
16906 - 41403E0D3240403E = 444
16914 - 0732424023CDA640 = 857
16922 - FE063029C627C627 = 835
16930 - CB2732434023CD8E = 805
16938 - 40FE063016E52143 = 727
16946 - 40B62F324340FEFF = 833
16954 - 260D0604213C40CD = 425
16962 - 6A42C3B440CF16AF = 1017
16970 - 323C40323D400614 = 375
16978 - 213C407ED3D73423 = 796
16986 - 7ED3DF10F33E07D3 = 1099
16994 - D73EFFD3DFC3B440 = 1405
17002 - 7ED3D7237ED3DF23 = 1182
17010 - 10F6C9F1066E0630 = 906
17018 - 06D70583053405E9 = 652
17026 - 04A20460042004E6 = 536
17034 - 03AE033E07D3D7DB = 894
17042 - D7CBB7D3DF3E0ED3 = 1322
17050 - D7DBD7EEFF4F0600 = 1227
17058 - 093E07D3D7DBD7CB = 1333
17066 - F7D3DF3E0ED3D73A = 1241
17074 - 3240D3DFC9000000 = 749

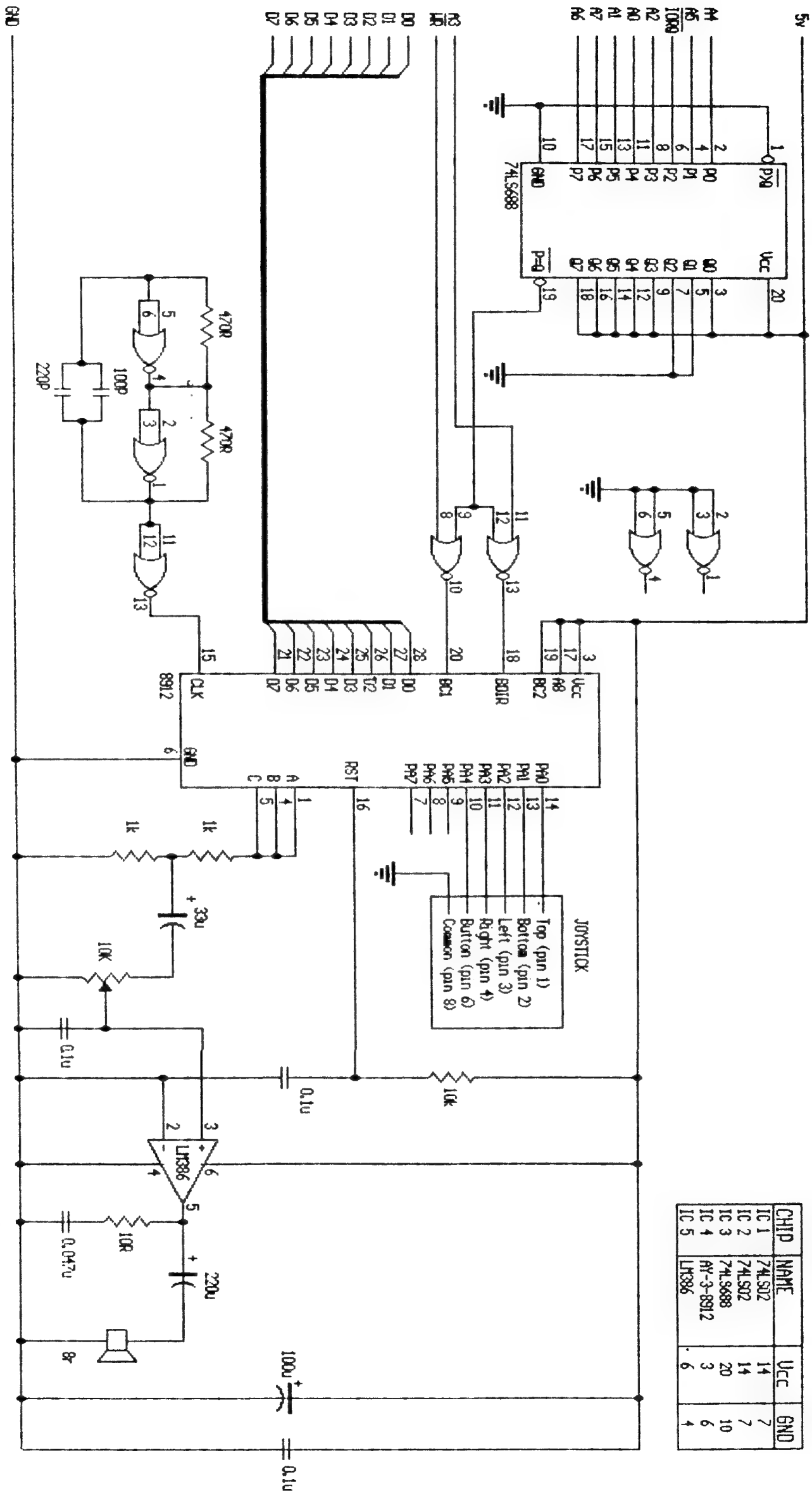
```

AY-3-8912 SOUND FOR THE ZX81



AY-3-8A15 SOUND FOR THE SX81 2691 1991





CHIP	NAME	VCC	GND
IC 1	74LS02	14	7
IC 2	74LS02	14	7
IC 3	74LS688	20	10
IC 4	AY-3-8912	3	6
IC 5	LMC386	6	4

AY-3-8912 SOUND BOARD

DRAWN: R. Bruneau Date: 26 Sept, 1994

DID
YOU
KNOW

2068 to be deserted???

I've been considering the idea that no one is using the 2068 anymore and that the newsletter should be converted to QL because only Hugh Howie is now writing anything for the us. I've looked over my back issues and realized that many of the articles from the past have been reprints from other newsletters. Surely we haven't published everthing that there is to know about the 2068. Who in the club gets the newsletters from other groups? Maybe they need to be shared with someone who uses a 2068.

That last statement assumes that there are still in-town 2068 users. If that is a bad assumption then I suppose that it is inevitable that Sinc-Link goes totally QL.

Another idea to determine the interest of the readers would be to publish a reader survey.

I know that there are still Larken 2068 users out there because of the response I have recieved from articles I have written for Sinc-Link. The fact that I duplicated my Larken dock board and disk interface to verify that I had correctly laid out the schematics for publication in Sinc-Link caused quite a bit of interest. I even had some other users volunteer to help try to figure out why I was unable to get the I/F working. I have also received requests for an article or two on how I built them. I suppose I will eventually write such an article (or articles) for whoever is supporting 2068. I hate to give up on Sinc-Link because it has been so helpful to me in the past.

If Sinc-Link goes 100% QL there are still other good newsletters out there that support the 2068. Two that I subscribe to are ZXir QLive Alive! from the Timex/Sinclair North American User Groups for \$10 per year (4 issues)

c/o Abed Kahale,
335 W. Newport Rd.
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60195-3106

and Nite Times News from the Chicago Area Timex Users Group for \$12 per year (6 issues)

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I would be interested in hearing about others that 2068 users find of interest. My main interest is Larken and adventure games.

Update magazine has been recommended to me but I have been unable to find an ad with the subscription price in it.

Les Cottrell 108 River Heights Drive Cocoa, FL 32922-6630

Broken LINK

From the editor

The folding of the SINC-LINK, the end of the Best of the Best Sinclair newsletter era, leaves a large gap in the Sinclair community. For more than twelve years, SINC-LINK provided us with top-notch articles and programs on all of the Sinclair computers — very thorough with help available on what ails you.

George Chambers, Hugh Howie and Jeff Taylor were the nucleus of the Newsletter. George, the most prolific, Bob Mitchell, Larry Crawford, Hugh Howie and very many more.

As George puts it; *"We have become long in the tooth and, at least for my part, I want to move onto other things."* — a state-of-the-art 486. He will still be available for advice on problems we may encounter, *"I shall be maintaining my TS-2068 computer system for some time to come."*

I can appreciate how publishing a newsletter can become a chore after so many years especially when articles become scarce. Although I enjoy working on the Newsletter, I do spend some 40 hours, learning Desk Top Publishing; editing, spell-checking, formatting, printing and so on, and then some, for affixing labels, stuffing envelopes, stamps etc.

"Any of you into MSDOS?"

George, you've probably discovered that MSDOS is still archaic by Sinclair standards although it seems that the end is near for it after Chicago (Windows 95) takes over in 95. It is clunky and not user friendly with limitations and intimidation; no true multitasking à la QL. Windows software, canned programs I don't dare disturb, have improved greatly to being more intuitive and user friendly in the last 12 months;

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the learning curve became very short for the initiated but with a penalty of more memory requirements both for RAM (8 Megs.) and disk space. It is too early to go into Multimedia unless you know your DMA's, IRQ's and I/O addresses. If you are finicky like myself, you would still like to write your own TS-2068 programs and have them run just the way you like, unless you are going into Visual BASIC or C++ programming. Good luck, bon chance to all.

We'll miss that **LINK**



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Bob Swoger

Address on page 2

747 Flight Simulator

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Bob Swoger

Address on page 2

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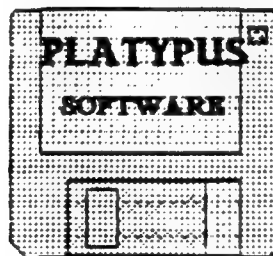
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OREGON CITY OR 97045

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Over 100 pages 8.5X11 Comb Bound

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Disk size/type

UPDATE! Magazine

The only known, privately produced Sinclair computer magazine that covers ALL of the Sinclair computers. We are now starting our 8th year of publication ! ! !

We are a large quarterly magazine that is produced on Sinclair computers. We cover the QL, Z88, TS-2068, Spectrum and the ZX-81. Minimum issue size is 50 pages, and does include ads from Sinclair dealers. The price is \$18 in US\$ in North America; \$22 elsewhere, and we do accept the British Pound or the German Mark equivalents for a subscription.

Send all funds and requests for a new subscription to:
UPDATE! MAGAZINE
PO BOX 1095
PERU, IN 46970 USA
Checks, travelers checks, cash are all acceptable.



MECHANICAL AFFINITY

SERVING ALL QL USERS

FRANK DAVIS
513 E MAIN ST
PERU IN 46970
317 473-8031 evenings & weekends

PAUL HOLMGERN
5231 WILTON WOOD CT
INDIANAPOLIS IN 46254
317 291-6002 evenings & weekends

Trump Cards, disk interface for two 300K or 720K disk drives, 896K of memory and TK2, reconditioned for \$100.

Gold Cards, 3 drive disk interface, 2 meg. memory, TK2 and 1.6 MHz speed, New for \$300, reconditioned one for \$230.

Super Gold Cards, built in 4-drive adaptor disk interface, 68020 processor, 4 Meg. of memory, runs at 2.5 MHz. speed, built-in true parallel printer port (with printer cable) and the latest TK2. The price is \$480. Contact us about our Trump, or Gold Card trade-in program.

Sinclair QL Printers, Black with QL logo, 9-pin printers that are made to run with the QL (serial). Price is \$60.

CUESHELL, the new graphic oriented desktop program for the QL, it gives you program options on the screen, which you can easily control, change or launch. It is a pointer environment driven and makes full use of level 2 drivers. Our Price is \$82.

Page Designer 3, the QL easiest to use full featured desk top publishing program, Comes with loads of fonts and cliparts in a 4 disk set. You can even use HDF fonts from Digital Precisions Professional Publisher, as well as other cliparts from other QL programs. Our price is \$83.

Txt87Plus, an excellent word processor that allows you to use drivers for all the latest printers, gives you many fonts as well as columns and precise control of paper size and print size. Our price is \$120.

LineDesign version2, a top of the line superb vector drawing program package that allows you to mix many! fonts and graphics (10 disk set) with your artwork. The price is \$153.

DataDesign 3, a fast pointer driven database that is easy to setup and use for the QL. The price is \$85.

Qliberator 3.36, compiles virtually all SuperBasic, and it is easy to use, with QL and QXL. The price is \$75.

Contact us for all your QL needs, We'll do our best!

Inventory Clearance Sale

We have a limited supply of some of these items
and when they are gone, they're gone!

RMG0107	2040 thermal paper (3 rolls)	Reg.\$2.00	\$.75+PH
RMG0102	TS 1000 computer package	Reg.\$29.95	\$12.50
RMG0105	TS 1016 16K RAMPACK	Reg. \$10.95	\$ 2.00
RMG0442	Magic Bridge 16K RamPack	Reg. \$3.00	\$.75
RMG0999	1000/1016 base pad	Reg. \$2.50	\$.75
(Holds TS1000 and RAMPACK-rubber)			
RMG0436	CompUSA 1000 keyboard bleeder	Reg.\$ 5.00	\$1.00
RMG0586	PC8300-TS1000 clone computer	Reg. \$39.95	\$25.00+PH
RMG0634	E-Z KEY keyboard interface PCB	Reg. \$10.00	\$3.00
(Requires parts and soldering)			
RMG0672	Book-The Ins & Outs Of TS1000	Reg. \$ 3.00	\$.75
RMG0910	TS1000 Dust Cover (Vinyl)	Reg. \$ 3.50	\$1.00
RMG0241	Book-Sams Beg/Tnt Manual	Reg. \$ 6.00	\$1.50
RMG0370	Book-Sams Int/Adv Manual	Reg. \$ 6.00	\$1.50
RMG0469	Book-TS2068 Basics & Beyond	Reg. \$ 5.00	\$2.00
RMG0945	Alphacom 32 Painter	Reg. \$39.95	\$25.00+PH
RMG0366	Thompson Case-holds 12 QL Mdvs	Reg. \$2.00	\$ 1.00

All TS-1000 cassette software (Timex brand) 10 pcs for \$1.50+PH. All TS-2068 cassette software (Timex brand) 10 pcs for \$2.50+PH. All TS SOFTSYNC TS-1000 software (cassettes) 10 pcs for \$ 3.00+PH

(Minimum order is 10 pieces on either)

Grab Bag Special! Our choices-10 pieces 1000 S/W only \$1.00+PH. 10 Pieces 2068 S/W only \$2.00+PH

For Listing Of Available Titles Send Legal S.A.S.E

Minimum Order: 10 of either type - Shipping:\$6.00 per order of 10 tapes

Shipping on the above items is \$6.00 minimum per order. Items with a (+PH) after price = extra shipping. Shipping is \$6.50 if ordering one of these items only. \$4 extra if ordered with other items. No more than \$15 shipping per order. (example: 10 pcs software plus 2040 printer = \$9.50 shipping) Canada - add 10% of total order (including shipping) to the total.

**This List Is From Folks Who Do Not Need The Items!
Now It Could Be Yours!**

1> TRS Tape Recorder	\$15.00
1> TS-2068 Power Supply	\$20.00
1> Book-Sams Beginner/Intermediate Manual	\$5.00
1> Book-Brain Games	\$5.00
Super Special:-- All Of The Above For C..ly	\$40.00 pp.
For Above Item(S) Please Use Reference # BWU1291	

1> Sinclair QL Package-Complete Set In Good Shape!	\$550.00
Includes: QL computer w/PSION s/w, JSU ROM, New Membrane, QL VISIONS RGB Monitor, QL NLQ Printer, All Cables. A Real Collector's Find! All Or None!	
1> QL Computer W/PSION S/W COLECO P/S Needs Membrane -	\$ 75.00
1> Set PHILLIPS 5.25" 1/2 HT 720K Drives	\$150.00
In Case With Power Supply And Cables	

1> I. C. E. EPROM Cartridge	\$20.00
1> Transform Keyboard Cover	\$5.00
1> Microbridge S/W -(QL)-FLP	\$20.00
1> DBEASY on FLP	\$10.00
1> Cable C Disk: FLP Filer	\$10.00
1> PASTE ART V1:FLP	\$5.00
1> QLIBERATOR MDV W/Manual	\$25.00
20> Update Magazines	\$25.00
16> IQLR Magazines	\$25.00
18> TIME DESIGNS Magazines	\$20.00
1> Taking The Quantum Leap book	\$20.00
1> Sinclair QL COMPUTING Book	\$5.00
1> QL Survivors Source Book	\$5.00
1> QL ICONTROLLER Cursor Controller	\$25.00
1> ZX81 16K RAMPAK	\$5.00
1> TS Telecommunications Manual 2068	\$6.00
10> QUANTUM LEVELS Magazines (QL)	\$12.50

For Above Items Please Use Reference # CLU1293

1> 6 Pack TS1000 S/W W/Docs - Includes Shipping! \$5.00
1> SHARP 4602 LAPTOP, 2 720K Floppy Drives, 640K RAM 10MHZ, 2 Serial/1 Par Ports - RGB/CGA Port - 5.25" Floppy Port - 2 Battery Packs - DOS 3.30 Backlit LCD Screen - Case With Many Pockets Also Included - All In Like-New Condition. Includes AC Adapter.

Make Us An Offer! (Reasonable!) \$ 475.00pp

For Above Items Please Use Reference # JCU0989

CNSN-1 All Prices Include Shipping! July 30, 1994.

More Items That Would Like To Find A New Home! Read This!

1> PC To QL Monitor Adapter (use QL monitor on PC) \$45.00. Like your QL Vision Monitor? Want to use it on your PC? This adapter w/power supply will allow you to do that with any CGA output.

1> TS-2068 In Wooden Case W/Large KB/Reset/More \$85.00pp

1> DMP-430 15" Dot Matrix Printer (Good Shape) \$110.00pp

For Above Item(S) Please Use Reference # DSU1190

1> BSR 1200 BAUD External Modem - Like New!	\$35.00
1> TANDY CoCo Package	\$40.00
1> Composite Monochrome 12" Monitor	\$45.00
1> TS-2068 w/monitor cable for RGB	\$85.00pp
1> LarKen DOS disk package: 2 FH drives in case w/PS, LarKen controller and cart. cables	\$275.00pp
1> LarKen RAMDISK 256K	\$150.00pp

For Above Item(S) Please Use Reference # REGU0591

1> TS-1000 In KRADLE Keyboard w/added RAM \$100.00
A Real Collector's Item!

1> Melbourne House Software Pack-8 Pieces \$25.00

1> SOFTSYNC Software Pack, 9 Pieces \$25.00

1> Software Farms HI-REZ Software Pack, 3 Pieces \$20.00

All 3 Titles For The 1000

1> TIMEX Software Pack, 3 Pieces \$10.00

1> Magazine/Book Pack--3 Books/21 Mags \$25.00

For Above Items Please Use Reference # FRSU0792

1> MIRACLE QL Printer Interface	\$40.00
1> QL Technical Guide	\$10.00
2> AERCO FD-68 Disk Interface w/256K RAM	\$105.00EA
1> COLECO Power Supply For Use With FD-68	\$5.00
1> RITEMAN 9 Pin Dot Matrix Printer	\$115.00

Includes: Tractor/Roll Feed w/8 Ribbons Graphics Compatible.

For Above Items Please Use Reference # RDSU0393

1> Timex Sinclair 1000/ZX81 Users Manual	\$2.50
1> The Timex Personal Computer Made Simple	\$2.50
1> Mastering Your TS1000 Personal Computer	\$2.50

Collector's Items

LIPINSKI'S Software Buyer's Guide To TS Products And Services In Loose Leaf Binder \$10.00+3SH

For Above Items Use Reference # HCU0793

1> Magnavox Monitor Model 8M7622-074B (Amber Composite)	\$55.00pp
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For The Above Item(S) Please Use Reference # FSU0494

CNSN - 3 Last Updated June 6, 1994

Here Is A Great Collection Of Items For You!

(1) Q-SAVE fast load amplifier (back panel removed) with both cassette software and EPROM firmware module, all docs \$38

(1) R.A.M. 2716/2732 EPROM burner and reader (mapped 8-16K). This is a really nice board with driver software/firmware and excellent docs which I built but never tested. Has (2) Textool ZIF sockets for burn and (4) Aries ZIF sockets for read, (2) 8255A. Has other options. Requires inexpensive power supply (like Oliger's EPROM burner ps.). Connects via short ribbon cable. I have over \$150 invested in this board requires final adjustment, Docs. \$40

RAM chips 4116-1. Most with slightly shortened leads. About 90 available at \$10 for all

(1) Byte Back Modem. Fully socketed. Built it myself and modified to new address in the 0-16K block. Software, all docs including kluge data included. Kluging necessitated removal of the case (included) but this modem could be converted back to stock without any trouble. Works fine \$30

(1) Timex 16K RAMPACK, used, in original boxes. \$4 each 2/\$7. (Add \$3 shipping for both \$1.50 for one)

(6) TS-1000 RAMPACKs all setup for the Hunter bank switch project in TS Horizons. The two small boards of each bank are joined together edge to edge with soldered-in 20 gauge wire jumpers to make a single long (very strong) board. Each long board has the edge connector modified to provide a standard Sinclair feedthru (the toughest part of the project). The entire 6-card stack is bolted rigidly together with small threaded rod and plastic spacers. I never got more than three

or four of these boards to run together. That was before I became aware of the evils of excessive bus loading. This might be cured with buffering and really should have been addressed more carefully in the article- Docs, software included. \$15

(3) TS-1000 motherboards. Complete and guaranteed to be OK \$7 each

(1) PC8300 Chinese ZX-81 clone - unused with original box. Has chiclet keyboard, sound capabilities and despite all inaccurate advertising, it will run existing ZX-81 programs ONLY if they are entirely in BASIC. \$20 + \$3 extra shipping.

(1) 300/1200 Baud modem board made by Hayes for an OEM. Still in the anti-static pack. It has diagrams enabling one to add the 1488, 1489 and power supply that the board lacks. A first class piece of hardware. \$15

Use Reference # VVU0491

CNSN-4 Last Updated: August 31, 1993

NOTICE!

Policy Change At RMG Takes Effect Immediately!

Effective September 1, 1994, any phone calls for assistance with computer related problems, whether for the TS computers or IBM clones, will be classed "CONSULTATION CALLS" and these will be billed out at \$20 per hour starting with the first minute. Minimum charge will be \$1.00. We have been here for all of our customers at no cost to you except for the phone call and have given thousands of hours to further the use of computers. With the expertise that we have gained having cost us a lot over the years, it is time to recoup some of our losses. If we do not do this, we will have to close our phone lines and stop doing "business as usual". We want to continue to help you with any and all problems that we are capable of helping with. If we cannot help, we will refer you to someone who is capable of helping. That referral alone should be worth something. You would not expect to call a doctor or a lawyer to ask them questions without expecting to pay for their time. If all I have that you need is inside my head and you want to make use of the knowledge there, then it will be there for you, as long as I get paid for it. Don't get us wrong, we will still gladly accept calls for price information and phone orders without a charge being made for them. The new policy, ONLY applies to "how do I do this" type calls. The only exception to this new policy will be for paid-up members of CCATS user group.

More favorable letters have arrived regarding the book THE BEST OF THE PLOTTER. We are pleased that you are happy with our efforts, As of this writing, we have not shipped the disks out yet, but again, we want to make sure that they are as complete and "bug free" as is Possible.

RMG Enterprises

14784 S QUAIL GROVE CIR

OREGON CITY OR 97045

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ZXir QLive Alive!

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Fall 1994